269. When the '038 patent issued, Genencor evaluated whether EBS-2 (*i.e.*, Spezyme Ethyl) would infringe the '038 patent. **A15213:15-19; A15385:1-3**.

270. Dr. Crabb worked with internal Genencor lawyers and outside counsel in evaluating EBS-2 with respect to the '038 patent. 227:1-8; 385:7-16. Outside counsel provided an opinion that EBS-2 did not infringe the '038 patent. 385:19-25. The Suzuki reference (**TE115, A8233-8238**) and the '038 patent file history were considered in that opinion. **A15386:1-7**.

271. Genencor studied Suzuki with respect to the '038 patent and to determine to determine if Spezyme Ethyl fell within the claims of the '038 patent. **A15215:19-15216:1**.

272. Dr. Crabb testified that Genencor's outside counsel advised Genencor that the '038 patent had no claims that were identical to the deletions described by Suzuki. **A15218:19-25**.

273. Contrary to Genencor's conduct with respect to the '038 patent and infringement with respect to EBS-1 (*i.e.*, Ultra-pHlo), Genencor did not offer any evidence that Genencor secured or relied upon an opinion of counsel that Spezyme Ethyl the manufacture, use, offer for sale, or sale in the U.S. or import into the U.S. of Spezyme Ethyl did not infringe the '031 patent or that the '031 patent was believed to be invalid or unenforceable.

274. Dr. Crabb submitted a declaration in which he set forth that Genencor did not believe that the '031 patent would be granted because the '038 patent was rejected by the USPTO during its prosecution over Suzuki. **A15212:4-12; TE228, A16005-16006 at ¶¶13-14**. However, Genencor knew that the '038 patent had been granted over Suzuki. **A15219:1-3**.

275. Before marketing of Spezyme Ethyl (EBS-2) began, Genencor had a "poor margin status relative to wild type *B. stear.* AA [alpha amylase]." **TE230, A16016**.

276. As early as August 2003, Genencor's existing alpha-amylase technology rendered Genencor uncompetitive. **A15186:22-15187:3, TE230, A16016**. In August 2003, Genencor admitted that "Our existing commercial AA [alpha-amylase] enzyme technology, when applied to ethanol, is hampered by technical performance and economic issues - rendering us uncompetitive." **TE230, A16018**.

277. Genencor reported that "The manufacturing group fully supports the concept of development & commercialization of EBS-2 and would benefit from the elimination of poor margin products from its portfolio." **TE230, A16017**. Genencor believed that Spezyme Ethyl would "allow us to become competitive versus NZ's Liquozyme SC." **TE230, A16016**.

278. Dr. Crabb testified that prior to introducing Spezyme Ethyl, Genencor tested it against Liquozyme to make sure Spezyme Ethyl would be competitive. **A15202:23-15203:2**.

279. Dr. Crabb testified that Genencor's basis for its assertion for non-willfulness is the denial of a preliminary injunction in this case. He testified as follows:

> Q. And your position that you stated in the deposition transcript portion that I referenced and Mr. Adamo referenced her today, that is a basis for your position why there is no willful infringement, the fact that the preliminary injunction decision came up long after the issuance date of the '031 patent, is that correct?
>
> A. Yes.
>
> Q. And just so it's clear, you remember that the preliminary injunction denial date was in the time frame of October 2005?
>
> A. I was not aware of that, but that sounds fine. **A15409:2-11**.

280. However, the preliminary injunction in this case was denied seven months after Genencor was already infringing the '031 patent by making, using, offering for sale, and selling Spezyme Ethyl. **A15392:19-15393:7; A15408:22-15409:1**.

281. Spezyme Xtra was developed as a back-up in case Genencor lost this litigation. 195:22-25. Spezyme Xtra was first tried to a customer in 4-5/06. **A15195:5-8**.

282. Although Spezyme Ethyl and Liquozyme are interchangeable in the dry mill fuel ethanol market (196:9-12), Spezyme Xtra is inferior to Spezyme Ethyl; and Liquozyme and was projected by Genencor to lose 70% of the business that Genencor had because of Spezyme Ethyl. **A15195:16-15196:1;TE447, A16232**.

283. Genencor reported that "the business guys [at Genencor] say that we will only retain 30% of our current customers with a switch to Ethyl 4 [Spezyme Xtra]. This is because even with two times enzyme dosing, some customer's conditions wouldn't get equal performance without adding calcium." **TE447, A16232**.

284. Based upon 2006 numbers, Genencor reported that a switch by Genencor to Spezyme Xtra would cost it several millions of dollars in gross margin, several millions of dollars in lost customers, and millions of dollars in increased production costs. **A15197:5-16; TE447, A16232**.

285. Spezyme Xtra has the same inferior thermostability characteristics as wild-type *B. stearothermophilus* alpha-amylase. **A15203:13-16**. It is less thermally stable than Spezyme Ethyl. **A15203:17-19**.

286. Dr. Crabb testified that Spezyme Xtra is not a substitute in the dry mill fuel ethanol market for Spezyme Ethyl at equal dosing. **A15203:24-15204:2**.

287. Genencor reported that "Our [Genencor's] application data has indicated that this product [Spezyme Xtra} is inferior to the current Spezyme Ethyl product in regards to product performance. A launch of this product [Spezyme Xtra] to the industry would be taking a step back as this enzyme would require an appropriate level of calcium to aid in its stability." **TE 298, A16068**.

288. Spezyme Xtra is more expensive than Spezyme Ethyl. **A15204:3-5**. Dr. Crabb testified that Spezyme Ethyl has significant cost advantages over Spezyme Xtra (**A15204:6-8**) and that Spezyme Xtra has a lower profit margin than Spezyme Ethyl. **A15204:9-11**.

289. The higher cost and lower margin of Spezyme Xtra were known by Genencor during its development. **A15204:12-15**.

290. In December 2005, Genencor reported that "Due to performance issues and competitive pressure, we have been informed that we will basically have 0 HTAA sales at Cargill for the next three years, or a loss of ~$3.2 million/year, and will lose at least $1 million/year at Corn Products locations immediately. If we make a conservative estimate that within a company news travels fast and the liquefaction costs can be held steady while hundreds of thousands can be saved in filtration, it will not be long until basically 100% of CP liquefaction enzymes will be awarded to NZ." **TE298, A16068**.

II. CONCLUSIONS OF LAW

A. NOVO NORDISK NORTH AMERICA, INC. SHOULD BE JOINED

291. On July 25, 2006 Novozymes A/S moved under Rules 15(a) and 21, seeking to add NA as a co-plaintiff. **DI144-47**. The Court denied the motion without prejudice (**DI178**) to allow Genencor further discovery. **DI182, 23:2-17**. The Court also asked for evidence on NA's standing under *Kalman* and *WMS Gaming*, so that the issue could be decided "on a full

evidentiary record." *Id.* Novozymes did so and renewed its motion at trial. **A15003:14-A15006:6**.

292. "Under certain circumstances, a licensee may possess sufficient interest in the patent to have standing to sue as a co-plaintiff with the patentee." *Rite-Hite,* 56 F.3d at 1552-53. As in *Waterman v. Mackenzie*, 138 U.S. 252, 255-56 (1891), "[a]ny rights of the licensee must be enforced through or in the name of the owner of the patent, and perhaps, if necessary to protect the rights of all parties, *joining the licensee with him as a plaintiff.*" Thus, the need and right to join a party such as Novozymes NA has long been recognized.

293. The co-plaintiff is usually a licensee, and "[s]uch a licensee is *usually* an 'exclusive licensee.'" *Id.* at 1552. A co-plaintiff standing in essentially the same shoes as the patentee has standing to be joined, even if not a traditional exclusive licensee. *WMS Gaming*, 184 F.3d at 1361 (wholly owned subsidiary had standing without mention of a license); *Kalman*, 914 F.2d at 1481 ("sole licensee" had standing); *Ricoh Co. v. Nashua Corp.*, 947 F. Supp. 21, 23-24 (D.N.H. 1996) (citing *Kalman;* manufacturing subsidiary had standing through an implied exclusive license).

294. Course of conduct controls, not semantics in corporate documents. Thus: "use of the word 'exclusive' is not controlling; what matters is the substance of the arrangement." *Textile Productions, Inc. v. Mead Corp.*, 134 F.3d 1481, 1484 (Fed. Cir. 1998). As in *Ortho Pharmaceutical Corp. v. Genetics Inst.*, 52 F.3d 1026, 1032 (Fed. Cir. 1995):

> It is the licensee's beneficial ownership of a right to prevent others from making, using or selling the patented technology that provides the foundation for co-plaintiff standing, not simply that the word 'exclusive' may or may not appear in the license.

295. Courts look for an "express or implied promise" by the patentee to the licensee "that others shall be excluded from practicing the invention within that territory." *Rite-Hite*, 56

F.3d at 1552; *see also Textile*, 134 F.3d at 1484 (licensee's standing is proper where "the patentee has promised, expressly or impliedly, that 'others shall be excluded from practicing the invention' within the field covered by the license."). The relationship and conduct between Novozymes A/S and NA demonstrates plainly that all others were and will be excluded from practicing the '031 Patent.

296. As stated in *Kalman*, 914 F.2d at 1481-82 (citations omitted):

> When the sole licensee, however, has been shown to be directly damaged by an infringer in a two supplier market, and when the nexus between the sole licensee and the patentee is so clearly defined as here, the sole licensee must be recognized as the real party in interest. Furthermore, in determining that [the sole licensee] has standing to join as a co-plaintiff, we not only give effect to principles of equity, but also the Congressional mandate that, in patent actions, "upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement."

297. All of these factors are present here. The substance of the arrangement between NA and A/s ensured that others are excluded from practicing the patent. The "nexus" between the patentee A/S and the licensee NA is extraordinarily close. NA is the only entity allowed to practice the patent. NA, along with A/S, was directly damaged by the infringement in a two supplier market.

298. NA is a wholly owned subsidiary of A/S. **A15011:3-8; 15054:9-15; A15160:25-15161:3.** NA's board is controlled by A/S. **A15014:12-15015:17; 15163:1-6**. A/S must approve all strategic decisions made by NA, ranging from the determination of NA's various budgets to the hiring and firing of factory workers. **A15010:7-15014:11, A15055:4-14, A15163:11-20**. A/S is entitled to all profits earned by Novozymes NA and controls how those profits are allocated throughout the Novozymes group of companies. **A15058:1-7; A15075:18-19**. A/S issues consolidated audited financial statements that incorporate the profits and losses of NA, and upon

which the stock of A/S is publicly traded. **A15055:25-15056:21; A15058:1-11; A15163:24-15165:6; A15166:3-15167:12**.

299. Other than its patentee parent, NA is the sole entity permitted to practice the '031 Patent in the U.S. **A15018:23-15019:7; A15034:17-15035:7; A15039:3-8**. Consistent with the Novozymes policy of not out-licensing its core technology, A/S has not and will not license the '031 or '038 patent to any other entity. ***Id***. This lawsuit evidences Novozymes' policy to diligently monitor for infringement and use all applicable legal means to prevent infringement of its patents.

300. Novozymes A/S and NA together sell Liquozyme in direct competition with Spezyme Ethyl in a two supplier market. **A15106:13-15107:2; A15180:2-14**. Genencor's sales of Spezyme Ethyl directly harm both Novozymes A/S and Novozymes NA -- those sales directly result in lost profits by both Novozymes entities. **A15058:1-11, A15102:5-15104:1, A15166:3-15167:12**.

301. Under these circumstances, NA is effectively an exclusive licensee of A/S. They have consistently functioned in this manner, and everyone, including Genencor, has treated them this way. NA has standing as a co-plaintiff with A/S, and it should be so-ordered. *WMS Gaming*, 184 F.3d at 1361; *Textile*, 134 F.3d at 1484; *Rite-Hite*, 56 F.3d at 1552; *Kalman*, 914 F.2d at 1481-82.

302. *Poly-America, L.P. v. GSE Lining Tech., Inc.*, 383 F.3d 1303 (Fed. Cir. 2004) is inapposite. There, the patentee was an independent sister corporation of a company that was losing sales to the infringer and had no control over the sale of the patented product or the income earned. *Poly-America, L.P. v. GSE Lining Tech., Inc.*, 2003 U.S. Dist. LEXIS 14130, at *1 (N.D. Tex. Aug. 13, 2003). The Federal Circuit relied on this distinction: "it is not clear here

whether Poly-America has itself suffered lost profits from the infringement, a matter that may be dealt with on remand." *Poly-America*, 383 F.3d at 1311.

303. Here, A/S as the 100% owner of NA, controls the sale of Liquozyme in the U.S. and reaps every penny of the income from those sales. **A15010:7-A15014:11; A15163:7-20**. A/S consolidates the profits and losses of NA on its accounts and thus itself suffers lost profits on any lost sales of Liquozyme on a dollar for dollar basis. **A15055:25-A15056:21, A15058:1-11, A15163:24-A15165:6, A15166:3-A15167:12**.

304. Policy reasons confirm that NA has standing. Parties should be joined to adequately protect the rights of the patentee. *Kalman,* 914 F.2d at 1482. There is no reason to limit joinder, such as mistaken rights, or ambush from multiple parties in different forums with tenuous piecemeal claims. *Gayler v. Wilder*, 51 U.S. (10 How.) 477, 494-95 (1850); *A.L. Smith Iron Co. v. Dickson*, 141 F.2d 3, 6 (2d Cir. 1944). Additionally, NA has standing in this action as a co-plaintiff because of its unequivocal implied exclusive license from A/S. **A15017:13-15019:14, A15022:7-17.** There is no confusion about who has rights to use the Novozymes inventions. There is only Novozymes, encompassing A/S and NA, jointly practicing and enforcing the '038 and '031 patents -- as Genencor has always known. The record confirms that NA has standing to join this lawsuit as a co-plaintiff. Novozymes' course of conduct shows that NA is a *de facto* exclusive licensee of the '031 and '038 Patents.[1] **A15010:7-15014:11, A15055:4-14, A15160:25-15161:3, A15163:11-20**. To avoid ambiguity and conform the pleadings to the evidence, NA can and should be joined as a co-plaintiff. .[2]

[1] Other reasons to add NA as a party are already briefed. e.g. diligence, balance of harm, and amending the pleadings would conform them to the evidence. **DI 145, 152, 165, 174.**

[2] Other reasons to add NA as a party are already briefed. e.g. diligence, balance of harm, and amending the pleadings would conform them to the evidence. **DI 145, 152, 165, 174.**

B. NOVOZYMES' CORPORATE STRUCTURE DOES NOT BAR FULL LOST PROFITS

305. Upon a finding of infringement, a court must award full compensation for the loss. 35 U.S.C. §284; *General Motors*, 461 U.S. at 654.

306. Novozymes A/S and NA act as one entity. *Kalman*, 914 F.2d at 1482; *WMS Gaming*, 184 F.3d at 1361; *Union Carbide*, 425 F.3d at 1377-78 (Fed. Cir. 2005), particularly in the manufacture, marketing, and distribution of Liquozyme to the U.S. fuel ethanol market. **A15010:7-15014:11**.

307. Novozymes A/S, the Danish parent, owns the '031 and '038 patents, controls NA as a wholly owned U.S. subsidiary, and coordinates all activities worldwide concerning patents, the fuel ethanol industry, and the manufacture and sale of Liquozyme. **A15010:9-15020:23.** Four of the five NA directors are employees of A/S. **A15014:12-15015:17, A15163:1-6.**

308. A/S sets the strategy through an industry strategy group headed in Denmark by A/S personnel. **A15010:7-15014:11; A15163:7-20**. NA implements that strategy under the supervision, direction, and control of A/S. ***Id***.

309. Financially, A/S and NA act as a single unit in dealing with the profits and losses coming from the sale of Liquozyme. **A15054:16-15056:20**. A/S owns 100% of the stock of NA and thus also owns all of its assets and liabilities. **A15011:3-8, A15160:25-15161:3.** A/S consolidates the profits and losses of all of its subsidiaries, including those of NA, into its own financial statement, upon which the stock of A/S is publicly traded. **A15055:25-15056:21; A15058:1-11; A15163:24-15165:6; A15166:3-15167:12**. Thus, a dollar earned by NA is a dollar earned by A/S, and a dollar lost by NA is a dollar lost by A/S. **A15166:3-15167:12**.

310. NA and A/S also act as one unit with respect to their intellectual property. A/S holds title to the intellectual property, including the '031 Patent covering Spezyme Ethyl and the

'038 Patent covering Liquozyme. **A15017:8-15018:14, A15022:7-17**. A/S does not out-license its core technology, which includes these patents. **A15015:19-15017:13**. It makes and sells product in the U.S. under these patents directly and only through NA. NA has an implied and *de facto* exclusive right, which allows Novozymes to compete most effectively in this market. **A15017:13-15019:14; A15022:7-17**. There is no licensing agreement that expressly sets forth the grant of these exclusive rights, because it was not necessary to do so. **A15024:16-15035:7, 15038:18-A15039:8**.

311. As a multinational corporate enterprise, Novozymes uses locally incorporated subsidiaries to operate most efficiently under local laws and regulations in jurisdictions throughout the world. **A15014:4-11**.

312. Multinational corporate patentees like Novozymes are not required to arrange their internal structures specifically to be eligible for full compensation, e.g. lost profits. "When Congress wished to limit an element of recovery in a patent infringement action, it said so explicitly." *Id.* at 653. *See also, Rite-Hite,* 56 F.3d at 1544-45; *Kalman v. Berlyn Corp.*, 914 F.2d 1473, 1482 (Fed. Cir. 1990); (ordering lost profits on sales by inventor-patentee's closely held corporation to effectuate "principles of equity" and "Congressional mandate" of adequate compensation); *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1361 (Fed. Cir. 1999) (ordering lost profits on sales lost by wholly owned subsidiary); *Union Carbide Chems. v. Shell Oil*, 425 F.3d 1366, 1377-78 (Fed. Cir. 2005) (lost sales of products by patentee's parent must be included in damages). The patent statute does not impose an extra burden on multinational companies, e.g. to forego a U.S. subsidiary, in order to recover lost profits when its patents are infringed. A/S is entitled to full compensation as lost profits, whether or not NA is joined as a co-plaintiff.

313. The infringer is responsible for lost profits when the injury was or should have been reasonably foreseeable by an infringing competitor in the relevant market. *Rite-Hite*, 56 F.3d at 1546.

314. Whether Novozymes nominally sells Liquozyme though A/S or NA, the loss of such sales to Spezyme Ethyl was foreseeable to Genencor. For example, the fuel ethanol market is and has been a two supplier market: Novozymes and Genencor. **A15106:13-15107:2; A15180:2-14**. *See also,* §**II.A.2**. They compete for the same customers and supply contracts. **A15123:23-15126:22; A15251:16-15252:2**. Genencor knew and intended that every sale of Spezyme Ethyl would be a lost sale of Liquozyme. **TE230, A16018; A15102:5-15104:1, A15123:23-15126:22; A15251:16-15252:2.** It was reasonably foreseeable that Genencor's sales of Spezyme Ethyl would mean lost profits by Novozymes. **A15102:5-15104:1; A15106:13-15107:2; A15236:1- 15241:20; A15242:25-15243:6; A15248:12-15249:12; A15019:15021:24**. There is no confusion about who really lost the sales.

315. It has been abundantly clear to Genencor that A/S and NA act as one. Genencor sought and was given full access to documents and witnesses from both A/S and NA. **A1147; A1164-1221**. At the preliminary injunction stage, the parties argued over whether the harm suffered by NA was irreparable. **DI 17, 25, 40, 50, 59**. During both trial phases, both sides elicited testimony from both A/S and NA witnesses and submitted both A/S and NA documents as trial exhibits. **A1147, A1164-A1221**.

316. Everyone in the fuel ethanol business and throughout this lawsuit consistently treats A/S and NA as one entity: Novozymes. **A1147, A1164-A1221; A15010:7-15014:11**.

317. Novozymes is entitled to recover lost profits, whether or not NA is a named party. Novozymes' use of a subsidiary to conduct its business in the U.S. does not bar a recovery of damages that would "fully compensate" it.

C. NOVOZYMES IS ENTITLED TO LOST PROFITS OF $20,365,465

318. When a plaintiff prevails on a claim for patent infringement, "the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer." 35 U.S.C. § 284. This statute "is expansive rather than limiting." *Rite Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1544 (Fed. Cir. 1995) (en banc). "It affirmatively states that damages must be adequate, while providing only a lower limit and no other limitation." *Id.*

319. A reasonable royalty is "a floor below which damage awards may not fall;" it is not the only form of compensation. *Id.* "Congress sought to 'ensure that the patent owner would in fact receive full compensation for 'any damages' [the patentee] suffered as a result of the infringement. *Id.* at 1544-45 (quoting *General Motors Corp. v. Devex Corp.*, 461 U.S. 648, 654 (1983)). To be "adequate" the damages "should approximate those damages that will fully compensate the patentee for infringement." *Id.* at 1545.

320. The fundamental question is: if the infringer had not infringed, what would the patentee have made? *Rite-Hite*, 56 F.3d at 1545 *citing Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476 (1964)).

321. The "adequate damages" to be paid by the infringer are the actual damages suffered by the patentee, "but for" the infringement -- typically his lost profits: "the sales and profits lost to the patentee because of the infringement." *Rite-Hite*, 56 F.3d at 1545.

322. Lost profits can be recovered whether or not the patentee's product is covered by the patent-in-suit. *Id.* at 1544-49 (holding lost profits are proper for lost sales of product

protected by different patent, not in suit). Full compensation for infringement "can best be viewed in terms of reasonable, objective foreseeability." *Id.* at 1546. "If a particular injury was or should have been reasonably foreseeable by an infringing competitor in the relevant market, broadly defined, that injury is generally compensable...." *Id. See also Minco, Inc. v. Combustion Eng'g, Inc.*, 95 F.3d 1109, 1118 (Fed. Cir. 1996).

323. Being responsible for lost sales of a competitive product is surely foreseeable; such losses constitute the full compensation set forth by Congress, as interpreted by the Supreme Court, while staying well within the traditional meaning of proximate cause. Such lost sales should therefore clearly be compensable. *Rite-Hite*, 56 F.3d at 1546.

324. Here, just as in *Rite-Hite*, "awarding lost profits fulfill[s] the patent statute's goal of affording complete compensation for infringement and compensate[s] Rite-Hite [Novozymes] for the ADL-100 [Liquozyme] sales that Kelley [Genencor] 'anticipated taking from Rite-Hite [Novozymes] when it marketed the Truk Stop [Spezyme Ethyl] against the ADL-100 [Liquozyme]'" *Id.* at 1544.

325. This also avoids "the 'whip-saw' problem, whereby an infringer could avoid lost profit damages altogether by ... using a first patented technology to compete with a ... second patented technology and ... using the second patented technology to compete with ... the first patented technology." *Rite-Hite,* 56 F.3d at 1544.

326. Genencor marketed the infringing Spezyme Ethyl product (covered by the Novozymes '031 patent) to compete, head-to-head, with the Novozymes Liquozyme product (covered by the Novozymes '038 patent). **A1006¶V-X; A10023, ¶57; A14502; A15202:14-17, A15377:15-15378:17**. Both products are genetically engineered, high performance alpha-

amylase enzymes, with high thermostability and low calcium requirements. *Id.* Both products have similar pricing and high profit margins. **A15295:9-23; TE-230, A16019**

327. "The loss of profits is not presumed to result automatically from infringing sales." *Kaufman Co., Inc. v. Lantech, Inc.*, 926 F.2d 1136, 1141 (Fed. Cir. 1991). To determine the amount of lost profits, "a patentee must show that 'but for' the infringement it reasonably would have made the additional profits enjoyed by the infringer." *Micro Chemical, Inc. v. Lextron, Inc.*, 318 F.3d 1119, 1122 (Fed. Cir. 2003). However, "A patentee need not negative every possibility that the purchaser might have bought another product other than his absent the infringement." *Kaufman*, 926 F.2d at 1141. The issue "is not based on a subjective, individualized inquiry, but on an objective standard of 'reasonable probability.'" *Id.* The patentee should be compensated for every infringing that *objectively and with reasonable expectation* would have gone back to him. *Cordis Corp.*, 2005 U.S. Dist. Lexis 10749 at *6 (D. Del. June 3, 2005).

328. In fact, the patentee can rely on "any method showing, with reasonable probability, entitlement to lost profits 'but for' the infringement. "The Panduit and two-supplier market tests are recognized methods of showing 'but for' causation" in a lost profits analysis. *Micro Chemical,* 318 F.3d at 1122).

329. The Panduit and two-supplier market tests are recognized methods of showing 'but for' causation. *Micro Chemical,* 318 F.3d at 1122.

330. The four-part Panduit test for lost profit damages is articulated in *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1156 (6th Cir. 1978). This test has been accepted and widely applied, as a "useful, but non-exclusive, way for a patentee to prove entitlement to lost profits damages." *Rite-Hite*, 56 F.3d at 1545 (citation omitted); *see also Golden Blount, Inc. v. Robert H. Peterson Co.*, 438 F.3d 1354, 1371-72 (Fed. Cir. 2006). Under *Panduit*, a patentee

must show: (1) demand for the patented product; (2) absence of acceptable non-infringing substitutes; (3) capability to exploit the demand; and (4) the amount of profit it would have made. *Id. see also Golden Blount, Inc. v. Robert H. Peterson Co.*, 438 F.3d 1354, 1371-72 (Fed. Cir. 2006). **A15235:1-15236:4.**

331. According to the Federal Circuit, "satisfaction of all four *Panduit* requirements compels us to find that it is reasonable to infer that the patentee probably would have made the sale but for the infringing sale." *Kaufman*, 926 F.2d at 1141. The same inference can be compelled in a two-supplier market. "When the patentee and the infringer are the only suppliers present in the market, it is reasonable to infer that the infringement probably caused the loss of profits." *Id.*

(a) The Patented Product Is In High Demand

332. The alpha-amylase products at issue in this lawsuit are genetically engineered, high performance enzymes. They are in high demand, particularly for the production of fuel ethanol -- a rapidly growing industry. **A15092:12-16; A15116:16-21; A15116:16-21.**

333. These premium enzymes have particularly desirable features, including high thermostability without calcium. These products are far more efficient and cost-effective than traditional non-thermostable alpha-amylase products. **TE-100, A7009 at 3:65-4:9**; *see also* **A10005, ¶3** ("Hence, the thermostability of the enzyme, its capacity to withstand high temperatures, is important to its effectiveness in industrial applications.").

334. The first high performance alpha-amylase on the market was Liquozyme, which was introduced by Novo Nordisk in 1999. **A15093:9-23.** Before Liquozyme was introduced, Genencor dominated the U.S. fuel ethanol market with its Spezyme Fred and G995/G997 products. **A15093:19-23.** These earlier products were *not* genetically engineered alpha-amylase variants; they are wild-type alpha-amylases. **A15090:19-15091:24; A10024, ¶61.** These

products do not have the high thermostability and low calcium properties of Liquozyme or the other alpha-amylases of the '031 and '038 patents. **A10024, ¶58; A15089:10-13; A15107:3-12**.

335. When Novozymes launched the patented Liquozyme product, "there was a wow factor with this enzyme. And in very short order, [the earlier products] were just progressively kind of wiped out." **A15094:1-3**. Liquozyme "took off" because "customers were seeing some real demonstrable differences" including a "viscosity reduction in their equipment process" to make a "more pulpable" mash. They could "add more corn, more grain … and therefore they could increase their throughput." **A15094:8-15095:4**. Efficiency was increased from about 10-12% ethanol to 14-16%, up to as much as 20%. **A15096:13-10597:6**. In this growing market, customers realized they could use Liquozyme to run existing plants faster and produce more ethanol, instead of expanding the plant physically. **A15098:8-10599:8**. Customers also "noticed there was a difference in [Liquozyme's] ability to withstand temperature variations in the process." **A15095:5-6; A15100:6-17**. Liquozyme "is able to handle high temperatures" and it can "perform for an extended time at high temperatures whereas other products typically had difficulty having a sustained performance at high temperatures." **A15089:17-24**. The low calcium requirement was desired, because it avoided a safety risk and avoided the costly and inconvenient need to address the buildup and removal of calcium scale from plant equipment. **A15089:7-13; A15089:25-15090:5**.

336. Before Liquozyme, Genencor's inferior products dominated the U.S. market. **A15093:19-23**. By 2004 the market had essentially flipped. Liquozyme had become "absolutely the dominant alpha-amylase. It was desired by customers. It was recommended by the engineering firms … [who] had performance guarantees they had to meet." **A15101:1-5**. Because of Liquozyme, market penetration for Novozymes in that period was "around 80-some

percent" in the dry mill ethanol business and reached as high as "86 percent." **A15101:18-A15102:1; A15092:8-9, A15093:2-8; A15101:18-15102:1**.

337. Spezyme Ethyl has the same high performance properties as Liquozyme and is able to compete in the marketplace because of them. **A15102:5-20; A15117:6-14**. According to Novozymes' expert Julie Davis, "there is definitely a demand for the patented product." This demand "is related primarily to the benefits associated with the patented technology." **A15236:21-24**. When Spezyme Ethyl entered the market in April 2004 (**A14502.**), "the consequence was that there was a product in the marketplace that had the same desirable properties, functionally that Liquozyme had .... [Spezyme Ethyl] had the same attributes, it was essentially the same product being offered at a much reduced price." **A15102:5-20**. Spezyme Ethyl was no more than a "me too" product.. As Mr. Faller explained (**A15106:19-25**):

> Well, I think what had happened since the introduction of Liquozyme in 1999, the industry, the customer base essentially had voted. They had made a mass exodus from the old technologies that were available and they moved to Liquozyme and with the appearance of Spezyme Ethyl, they now had another product of like performance, of identical performance that was available to them.

338. Genencor does not dispute that there was and is a great demand for these patented highly-thermostable alpha-amylase products, and that they have been enormously successful in the marketplace. When Liquozyme entered the market in 1999, Genencor admittedly had no competitive product and Novozymes became the dominant player -- until the entry of Spezyme Ethyl. **A15181:3-19**. Without Spezyme Ethyl, Genencor admittedly had no alpha-amylase with the right combination of properties to satisfy customer requirements comparable to Liquozyme. **A15181:3-19; A15182:6-22L A10024, ¶58.** Although older products continue to be available, the Court has previously noted that, "None of those products had a sufficient combination of acid tolerance, thermostability and low cost to be economically viable for use in fuel ethanol

production." **A10024, ¶58**. Without Spezyme Ethyl, Genencor was loosing customers to Liquozyme, and not to anything else. Spezyme Ethyl has sold at a higher price and profit margin than Genencor's other alpha-amylase offerings. **A15202:14-17; A15292:4-19**. In terms of sales volume, some 7-8,000 kilos of patented product have been sold during the damages period alone (March 2005 through September 2006). **A15236:9-18**. In dollars, Novozymes has made sales of more than $100 million of its Liquozyme products. **TE-480, A16596-A16602.** In the approximately two years that Genencor sold the infringing Spezyme Ethyl, it has achieved more than $20 million in sales. **TE274A, A16056**. *See also,* **A10024, ¶59**.

339. The "demand" prong of the *Panduit* test for lost profits has been met.

(b) <u>There Are No Acceptable Non-Infringing Alternatives</u>

340. "The 'acceptable substitute' element, though it is to be considered, must be viewed of limited influence where the infringer knowingly made and sold the patented product for years while ignoring the 'substitute.'" *Panduit*, 575 F.2d at 1162, n.9. *See also*, *Stryker Co. v. Inter Medics Orthopedics, Inc.*, 96 F.3d 1409, 1418 (Fed. Cir. 1996).

341. "[A] product on the market which lacks the advantages of the patented product can hardly be termed an [acceptable] substitute." *Standard Havens Prods., Inc. v. Gencor Indus, Inc.*, 953 F.2d 1360, 1373 (Fed. Cir. 1991).

342. Spezyme Fred, G995, and G997 dominated the market before the introduction of Liquozyme. 94:19-23.

343. While Genencor might have sold these non-thermostable alpha-amylases to some less demanding customers, these are not "acceptable" non-infringing substitutes. *Stryker Co. v. Inter Medics Orthopedics, Inc.*, 96 F.3d 1409, 1418 (Fed. Cir. 1996) ("The critical question was not whether there were competing devices, but whether there were acceptable substitutes."). Fred, G995/997 and Xtra are admittedly inferior and far less suitable for the rigorous demands of

the fuel ethanol and other industries, especially when used in dry mill plants. **A10024, ¶58; A15107:3-24; A15530:24-15331:18**. Because these other products have different characteristics that make them uneconomical and impractical for the relevant market, they cannot be considered *acceptable* non-infringing substitutes. *Stryker*, 96 F.3d at 1418 (products that lack the specific advantages of a patented product "could hardly be termed acceptable substitutes"); *see also Crystal Semiconductor*, 246 F.3d at 1356 (acceptable non-infringing substitutes do not include products "with disparately different prices or significantly different characteristics").

344. The market changed dramatically when Liquozyme was introduced. The differences between the properties of Liquozyme and the older products coupled with the increased ethanol yields and cost and capital reductions due to Liquozyme, rendered the older products non-competitive. **A15093:24-15094:21; A15096:25-15097: A15098:15-25; A15107:3-12**. Novozymes' Mr. Faller testified that "They were virtually eliminated from the marketplace …." **A15111:15-22**.

345. Novozymes was the dominant player in the market until the introduction of Spezyme Ethyl. **A15181:13-19**.

346. Customers would switch from Spezyme Fred to Liquozyme and after a trial period, move to Liquozyme and once Spezyme Ethyl was available, move to Liquozyme or Spezyme Ethyl. They typically did not switch back. **A15110:14-23; A15112:11-15**.

347. Expert Julie Davis explained for Novozymes that the relevant market was Spezyme Ethyl customers, who would reasonably be expected to "want the same benefits and advantages that they had enjoyed when they were using Spezyme Ethyl." **A15243:3-6** No other high performance products is out there, so Ms Davis "would expect them only to be happy with the Liquozyme product as an alternative." ***Id***. She thoroughly analyzed the fuel ethanol market,

including the sales trends for Spezyme Fred, Liquozyme, Spezyme Ethyl, and Spezyme Extra, from 2003 through the third quarter of 2006. (Ethyl appeared in Q2 of 2004 and Xtra appeared in Q3 of 2006). **TE-485; A15237:115242:19**. She found that Liquozyme was on a consistent upward march in sales until Spezyme Ethyl appeared in April 2004. Sales of Spezyme Ethyl increased consistently from its launch until late 2006 when it was withdrawn. Sales of Liquozyme correspondingly decreased over this period, although they did recover somewhat when the market itself expanded. **A15240:2-21; A15241:14-20**. In contrast, sales of Spezyme Fred remained "a fairly stable number throughout … even after the introduction of Spezyme Ethyl." **A15241:21-15242:2**. From this, it is seen that some customers have different needs and are happy with Fred, "they have purchased Spezyme Fred in the past and they continue to purchase Spezyme Fred." **A15243:9-14**. "But for those who have converted over to Spezyme Ethyl, they presumably did so [because] they wanted the higher performance aspects of that product and now would want to continue to enjoy those attributes even if the Ethyl was no longer available to them." **A15243:14-18**.

348. In June 2005, Valley Research announced the launch of a product, Ultra-Thin, for the dry mill fuel ethanol industry. 118:18-21. However, Ultra-Thin has not yet made any significant penetration into the U.S. dry mill fuel ethanol market. **A15188:3-6**. Ultra-Thin has been of little commercial relevance. **A15118:1-5**.

349. Third parties, such as Archer Daniels Midland and China, may be potential competitors in the future, but there is no evidence that they were offering alternative products in March 2005 or today. **A15143:17-18; A15144:1-5; A15158:19-25; A15244:13-15245:3**.

350. There were only two competitive products - Liquozyme and Spezyme Ethyl. 118:12-14. Genencor admitted that, in March 2005, the U.S. dry mill fuel ethanol market was a

two player market with only Novozymes and Genencor competing. **A15180:6-9**. Genencor also admited that Genencor and Novozymes will be the only significant suppliers of alpha-amylases to this market in the future. **A15180:10-14**.

351. No other company was or is present in the market. **A15106:9-25; A15110:18-24; A15180:2-15181:19; A15237:4-15238:21; A15240:18-15241:20; A15242:23-15248:20; TE485, A16630**. No one else had a competing product on sale or ready for an imminent launch. There is no product on the horizon which is known to have the advantages of the '031 patented product. **A15243:7-15248:20**. There is no showing that any potential or prototype product would not infringe. **A15187:14-15188:2**. There is no consensus in the market that any such product would be an acceptable alternative. **A15243:7-15248:20**.

352. Had Genencor not sold its infringing product, those sales would have reasonably been made by Novozymes and its Liquozyme product. Without Spezyme Ethyl, no comparable product from any supplier was available; customers buying a high performance alpha-amylase could only buy Liquozyme. *Micro Chem. v. Lextron, Inc.*, 318 F.3d 1119, 1125 (Fed. Cir. 2003) ("If the patentee shows two suppliers in the relevant market, capability to make the diverted sales, and its profit margin, that showing erects a presumption of 'but for' causation [of lost profits]."); *see also Crystal Semiconductor Corp. v. Tritech Microelecs. Int'l, Inc.*, 246 F.3d 1336, 1356 (Fed. Cir. 2001) ("In the two-supplier market, it is reasonable to assume, provided the patent owner has the manufacturing and marketing capabilities, that it would have made the infringer's sales. In these instances, the *Panduit* test is usually straightforward and dispositive.").

353. In March 2005, there was no Spezyme Xtra product. **A15350:17-25**. Development of Spezyme Xtra began in September 2005, and product was not available until June or July 2006. **A15194:9-21; A15351:1-6**.

354. Spezyme Xtra is too little too late, as Genencor admits (**TE-298, A16068**):

> Our application data shows that this product [Xtra] is inferior to the current GMO [genetically modified organism] Spezyme Ethyl in regards to product performance. A launch of this product to the industry would be taking a step back as this enzyme would require an appropriate level of calcium to aid in its stability.

See also **TE-447, A16232**.

355. Dr. Teece testified that Spezyme Xtra could have been sold as a non-infringing substitute. However, Spezyme Xtra was not available in April 2005 when Spezyme Ethyl would have to have been withdrawn from the market because of the issuance of the '031 patent. Further development of Spezyme Xtra did not begin until June or September 2005 and took about one additional year. Spezyme Xtra did not become available until July 2006. **A15247:6-20; A15402:1-3**.

356. Dr. Teece's three to six months to get Spezyme Xtra to market in the "but for" world is unrealistic in light of the fact that it actually took longer in the real world and that Spezyme Ethyl took an additional years to develop after it was bought from EBS as a product already in development. **A15428:22-15429:1; A15530:11-23**.

357. Furthermore, Spezyme Xtra is a wild-type alpha-amylase similar in properties to Spezyme Fred and inferior to Spezyme Ethyl and Liquozyme. **A15247:6-15248:11**. Genencor's Mr. Beto and Dr. Crabb admit that Spezyme Xtra is an inferior product, is not as thermally stable as Spezyme Ethyl, requires more product to have the same effect as Spezyme Ethyl, but is being sold around the same price/kg as Liquozyme. **A15530:24-15531:18; A15534:21-15535: 15; TE274**.

358. Spezyme Xtra has been on the market for four months and in its first three months on the market Genencor sold only 1 truckload/month. It only sold ten truckloads in September

20006. This is not much, so it is too early to tell whether it is an acceptable substitute for Spezyme Ethyl. **A15532:17-24; TE483**.

359. *In Grain Processing Corp. v. American Maize-Products Co.*, 185 F.3d 1341, 1343-44 (Fed. Cir. 1999), the Federal Circuit held that "a technology not on the market at the time of infringement can, in certain circumstances, constitute an available, non-infringing alternative." *Micro Chem.*, 318 F.3d at 1122. *Grain Processing* was limited to particular facts where the defendant had the ability to *immediately* switch to an acceptable non-infringing manufacturing method by making a simple processing change. *Id.* at 1123 (in *Grain Processing*, defendant had ability "to convert to the substitute manufacturing process in the remarkably short period of two weeks"). Here, there is no probative evidence that either Genencor or any third party could actually have begun manufacturing and sales of any acceptable substitute at any time after the '031 patent issued. Furthermore, there is no real evidence that the very recently launched Spezyme Xtra product was that easy and imminent, nor that it actually is an acceptable substitute. **A15247:6-15248:16; A15344:12-15**.

360. *Grain Processing* warned specifically that its holding was limited to situations where an acceptable non-infringing substitute was so easy and forthcoming that it actually "was available" at the time infringement began, rather than only potentially or theoretically available. *Grain Processing*, 185 F.3d at 1343: "Acceptable substitutes that the infringer proves *were available* during the accounting period can preclude or limit lost profits; substitutes only *theoretically possible* will not." If an alternative product was still under development or had not yet been considered at the time infringement began, it cannot be deemed an acceptable non-infringing substitute. "When an alleged alternative is not on the market during the accounting period, a trial court may reasonably infer that it was not available as a non-infringing substitute

at that time." *Id. See also, Micro Chem.*, 318 F.3d at 1123 (distinguishing *Grain Processing* where defendant took over four months to convert its product and "did not have the necessary equipment, know-how, and experience to make the [non-infringing] machine at the time of infringement"); *see also Cordis Corp. v. Boston Sci. Corp.*, Civ. No. 03-027-SLR, 2005 U.S. Dist. Lexis 10749, *6 (D. Del. June 3, 2005) ("that a licensee could make a [non-infringing product] does not mean that there are non-infringing alternatives available on the market"); *Honeywell Int'l, Inc. v. Hamilton Sundstrand Corp.*, 166 F. Supp. 2d 1008, 1030 (D. Del. 2001) ("Technology which is still in development during the accounting period is not considered to be an available alternative."), *aff'd in part and rev'd in part on other grounds*, 370 F.3d 1131 (Fed. Cir. 2004).

361. Genencor cannot show that an acceptable non-infringing alternative "was available" by offering speculation that some other product, e.g. Xtra, *might have been* available sooner or is hoped to be deemed acceptable later. **A15247:6-15248:16; A15344:12-15**. "Mere speculation or conclusory assertions will not suffice," *Honeywell*, 166 F. Supp. at 1030. *See also Kaufman Co. v. Lantech, Inc.*, 926 F.2d 1136, 1142 (Fed. Cir. 1991) (an alleged substitute that was "immature and more expensive than the patented technology during the time of infringement cannot have been an acceptable non-infringing substitute").

362. As shown at trial, none of the products identified by Genencor were available and acceptable non-infringing substitutes. **A15249:9-12**.

363. The "no alternatives" prong of the *Panduit* test for lost profits has been met.

(c) Novozymes Had the Capability and the Capacity the Meet the Demand

364. It is stipulated by the parties that Novozymes had the manufacturing capacity to supply its Liquozyme products to all of Genencor's customers that had been purchasing

Spezyme Ethyl, without delay, and with sufficient resources to meet such demand, and without having to forego other opportunities for profit. **A14503-04; A15249:13-15250:2.**

365. Likewise, Novozymes had the marketing and sales capacity to serve Genencor's customers and to make the additional sales of its Liquozyme products. **A15252:3-7**. Novozymes has already shown that it could market Liquozyme to the entire industry, converting customers from older low performance alpha-amylases to its patented premium product, thereby increasing its market share from about 20% to as much as about 86%. **A15092:8-15093:8; A15092:21-15093:1; A15101:8-15102:1**. Novozymes and Genencor already compete directly for the same customers. Novozymes is in touch with the same customers at the same ethanol plants and buying groups. Many are former customers that Genencor switched to Spezyme Ethyl, by offering equivalent performance at a lower price. **A15102:14-20; A15103:11-15104:1; A15404; A15195:9-12**. Novozymes has sales personnel "that were already trying to reach out to each of these plants that were in the market over this period of time." **A15251:20-25**. This included the capacity to conduct large-scale plant trials. **A15111:1-11**. The sales force was large enough and growing. In 2005 Novozymes had 5 account managers for this market, and has 7 now. **A15123:23-23; A15125:6-25.** Technical service personnel also work on marketing, and their ranks have grown as well. **A15127:9-24**. This was sufficient to meet demand, as well as projected growth. **A15126:4-22; A15128:5-17.** There is no doubt that Novozymes had the marketing resources to make increased sales of Liquozyme in place of the infringing Spezyme Ethyl. **A15252:3-7**.

366. In Spring 2005, Novozymes had six account managers for the dry mill industry (124:23-125:15) and could afford to hire and train additional account managers. **A15125:12-22**.

367. In Spring 2005, Novozymes had six or seven technical service people and could afford to hire and train additional technical service persons. **A15127:20-25**.

368. Novozymes, in Spring 2005, had sufficient resources to handle conversion of Genencor's Spezyme Ethyl customers to Liquozyme. **A15124:16-15125:5**.

369. The parties stipulated that since March 15, 2005, NA has had sufficient resources to meet the demand for Liquozymein the absense of Spezyme Ethyl without having to forego other opportunities for profit. **DI194 at III.J & K**.

370. From the time the '031 patent issued, until the last sale of Spezyme Ethyl, every sale of Spezyme Ethyl by Genencor was a sale that Novozymes reasonably would have made, by selling Liquozyme.

371. The "capacity" prong of the *Panduit* test for lost profits has been met.

(d) Novozymes Suffered Quantifiable Lost Profits Due to Past Infringement

372. Novozymes can recover for this lost profit on its actual sales. *Crystal Semiconductor*, 246 F.3d at 1357 ("Reduction of prices, and consequent loss of profits, enforced by infringing competition, is a proper ground for awarding of damages.") (quoting *Yale Lock Mfg. Co. v. Sargent*, 117 U.S. 536, 511 (1886)).

373. Novozymes lost substantial sales and profits as a direct result of targeted competition from Spezyme Ethyl. But for Spezyme Ethyl and Genencor's infringement, Novozymes would have sold Liquozyme to those customers, and Novozymes would have made those profits.

374. "Any doubts about the calculatory precision of the damage amount must be resolved against the infringer." *Kaufman*, 926 F.2d at 1141.

375. Novozymes would reasonably have charged $3.43/kg in 2005 (**A15256:24-15257:5**) and $3.38/kg in 2006 (**A15257:2-23; A15452:9-20**). Genencor sold 3,378,163 kg of Spezyme Ethyl to the U.S. fuel ethanol industry from March 15 through December 31, 2005. These would have been sales of Liquozyme at $3.43/kg. **TE-487, A16634**.

376. From January 1 through September 2006, Genencor sold 3,621,081 kg of Spezyme Ethyl. These would have been Liquozyme sales, at $3.38/kg. **TE-488, A16636**.

377. The lost sales in 2005 were 3,372,163 kg at $3.43/kg. or $11,566,520. The lost sales in 2006 were 3,621,081 kg at 3.38/kg or $12,239,254. **TE-487, A16634; TE-488, A16636**. This comes to $23,805,774. Novozymes' net profit margin was 74%. **A15268:5-15269:7; A15296:8-11**. Thus, the profit Novozymes would have earned, but lost to Genencor's infringement, was 74% of the total lost sales: $17,616,274. **TE-489, A16638**; **A15270:2-12; A15257:24-15258:9**; **A15268:5-15269:7; A15296:8-11**.

378. "To recover lost profits on a theory of price erosion, a patentee must show that 'but for' infringement, it would have sold its product at a higher price." *Ericsson, Inc. v. Harris Corp.*, 352 F.3d 1369, 1378-79 (Fed. Cir. 2003) (citing *BIC Leisure Prods., Inc. v. Windsurfing Int'l, Inc.*, 1 F.3d 1214, 1220 (Fed. Cir. 1993)).

379. But for Spezyme Ethyl, Novozymes would have sold the same amount as Genencor, at March 15, 2005 Liquozyme prices (when the patent issued), followed by a projected reduction of 1.5% on January 1, 2006. **A15297:10-18**.

380. The market for alpha-amylase products is inelastic over the price ranges, sales volumes and time periods at issue. **A15535:22-15536:7** *See Ericsson,* 352 F.3d at 1379. If consumers no longer had a cheaper yet equivalent alternative to Liquozyme, they would have bought Liquozyme in the same quantities at its existing price. They would have paid $3.43/kg in

2005 and $3.38/kg in 2006. **A15535:22-15536:7; A15547:13-19; A15452:9-20**. As Ms. Davis explained (**A15536:18-25**):

> What I calculated in my analysis is a selling price equal to the price customers paid for Liquozyme in March of 2005. It doesn't seem at all unreasonable to believe that the Spezyme Ethyl customers will pay the same amount the Liquozyme customers did. In fact, many of those Spezyme Ethyl customers, as we know, used to be Liquozyme customers, so they were buying it at that higher price.

381. Novozymes' prices would have held steady, and all the same sales would have been made, but for the unfair competition from Genencor's infringing product.

382. By analyzing the pricing over time for Liquozyme and Spezyme Ethyl, Ms. Davis found that before the '031 patent issued, the price of both products was relatively constant. **A15352:4-25; A15553:12-15554:11; TE492A, A16646**. After the patent issued, Novozymes was forced to lower its price in response to the infringement. *Id.* Prices continued to erode over time. This post-patent price erosion is profit that Novozymes lost. **A15294:10-15296:24; TE-492A, A16646**.

383. During the infringement and because of it, Novozymes was forced to sell Liquozyme for less than the $3.43 and $3.38 prices it would have charged. The lost profit on Liquozyme due to this price erosion is the difference between the benchmark price and the actual price, multiplied by the kilograms sold. **A15297:19-A15298:21; TE484, A16628; TE492A, A16646**.This was a loss of $2,693,104. ***Id.***

384. In addition to the fuel ethanol market, Genencor sold Spezyme Ethyl to some minor markets, for $701,082. **A15271:11-15272:13; TE-404A, A16230**. A fair royalty for these secondary sales is no less than 8%. **A15288:1-15289:5**.

385. This is reasonable given the very small size of this market and the relative lack of information about it, compared to the U.S. fuel ethanol market. **A15270:14-A15271:13;**

A15287:22-A15289:21. One 1995 license from Genencor to Novozymes provides some guidance for royalties in a 5-8% range for a less critical technology or market. The upper end of this range (8%) is a fitting royalty to compensate Novozymes for Genencor's 2005-2006 infringement in a minor market. This comes to $56,087. **TE-489, A16638**.

386. The total of these damages is $20,365,465 plus pre-judgment interest.

387. "In the two-supplier market, it is reasonable to assume, provided the patent owner has the manufacturing and marketing capabilities, that it would have made the infringer's sales." *Id.* at 1124 (quoting *State Indus., Inc. v. Mor-Flor Indus., Inc.*, 883 F.2d 1573, 1578 (Fed. Cir. 1989). A patentee must show: (1) that the relevant market contains only two suppliers, (2) that it was able to make the sales diverted by the infringer, and (3) the profit it would have made from the diverted sales. *Id.* "In essence, the two-supplier market test collapses the first two Panduit factors [(demand and no alternatives)] into one 'two suppliers in the relevant market' factor." *Id.*

388. The relevant market "excludes alternatives to the patented product with disparately different prices or significantly different characteristics." *Id.* (quoting *Crystal Semiconductor Corp. v. Tritech Microelecs. Intn'l, Inc.*, 246 F.3d 1336, 1356 (Fed. Cir. 2001)). The inquiry then "focuses on the number of companies involved, not the number of alternatives in the relevant market." *Id.* at 1124-25. When the patentee and the infringer are the only suppliers, a patentee who can meet demand and quantify its loss is entitled to fully recover -- unless the infringer shows that diverted sales would not *reasonably* have been made by the patentee. *Id.* (citing *Kaufman Co., Inc. v. Lantech, Inc.*, 926 F.2d 1136, 1142 (Fed. Cir. 1991)).

389. Here, the relevant market is for high performance alpha-amylases in the fuel ethanol industry. **A15237:23-15238:14; A15242:23-15248:20**. Genencor's Spezyme Ethyl converted a one-supplier market in a superior and one-of-a-kind patented product (Liquozyme),

arduously developed by Novozymes, into a brutal two-supplier market. **A15106:9-25; A15110:18-24; A15180:2-15181:19; A15237:4-15238:21; A15240:18-15241:20; A15242:23-15248:20; TE485, A16630**. Genencor forced Novozymes and its patented high-end product into competition with Novozymes' *own* patented alternative, misappropriated and sold without compunction by Genencor, at a lower price. **Id.; A15102:14-20; A15103:11-15104:1; A15404; A15195:9-12; TE492A, A16646**. "But for" Spezyme Ethyl, Novozymes would reasonably have made 100% of the sales for highly thermostable alpha-amylase products in the fuel ethanol market. **A15248:21-15249:3; A15298:23-15299:20**. This is the likely outcome "with infringement factored out of the picture." *Crystal Semiconductor*, 246 F.3d at 1355 (quoting *Grain Processing Corp. v. American Maize-Products Co.*, 185 F.3d 1341, 1350 (Fed. Cir. 1999)); *see also Ericsson, Inc. v. Harris Corp.*, 352 F.3d 1369, 1377 (Fed. Cir. 2003).

390. In this two-supplier market, just as under the *Panduit* test, Novozymes would reasonably have made all of Genencor's sales of Spezyme Ethyl. Novozymes' lost profits are $20,365,465 -- plus prejudgment interest. **A15301:22-24; A15540:12-23; TE484, A16628**.

391. Both the *Panduit* and two-supplier tests has been met. As in *Kaufman*, 926 F.2d at 1141, "when the fact situation compels the reasonableness of the inference [of lost profits] via both courses, the inference approaches conclusiveness." Here, the patented product is in demand, Novozymes can meet that demand, there is no acceptable alternative, and the lost profits are quantifiable.

D. ALTERNATIVELY THE MINIMUM REASONABLE ROYALTY RATE IS 25%

392. A prevailing patentee is entitled at least to a reasonable royalty for infringement. 35 U.S.C. § 284. "The royalty may be based upon an established royalty, if there is one, or if not, upon the supposed result of hypothetical negotiations between the plaintiff and defendant." *Rite-*

Hite, 56 F.3d at 1554. "The hypothetical negotiation requires the court to envision the terms of a licensing agreement reached as the result of a supposed meeting between the patentee and the infringer at the time infringement began." *Id.* "Factors relevant in a reasonable royalty determination using this method include those set out in *Georgia-Pacific*." *Micro Chem., Inc. v. Lextron, Inc.*, 317 F.3d 1387, 1393 (Fed. Cir. 2003); *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *aff'd*, 446 F.2d 295 (2d Cir. 1971).

393. The factors that are considered under Georgia- Pacific are:

(i) the royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty;

(ii) the rates paid by the licensee for the use of other patents comparable to the patent in suit;

(iii) the nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold;

(iv) the licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly;

(v) the commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promotor;

(vi) the effect of selling the patented specialty in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales;

(vii) the duration of the patent and the term of the license;

(viii) the established profitability of the product made under the patent; its commercial success; and its current popularity;

(ix) the utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results;

(x) the nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.;

(xi) the extent to which the infringer has made use of the invention; and any evidence probative of the value of that use;

(xii) the portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions;

(xiii) the portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer;

(xiv) the opinion testimony of qualified experts; and

(xv) the amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee - who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention - would have been willing to pay as a royalty and yet be able to make a reasonable profit and which

amount would have been acceptable by a prudent patentee who was willing to grant a license.

394. A royalty should be recovered on all sales for which lost profits are not available. *Crystal Semiconductor*, 246 F.3d at 1354.

395. To determine a reasonable royalty, expert Davis examined relevant documents of the parties and interviewed witnesses. **A15232:15-15233:18.** She considered the reasonable royalty guidelines set forth in *Georgia Pacific*, weighing them as she correctly found appropriate. She studied other licenses, and focused on a hypothetical negotiation between a willing buyer and seller at the relevant time. *Id.* **A15276:20-15279:2**.

396. Genencor and Novozymes are direct competitors in a two-supplier market, sales by Genencor would be a loss for Novozymes. This indicates a substantial royalty. **A15282:14-15283:2**.

397. The patented product is very profitable, with a predictable 74% margin for Novozymes and 71% for Genencor. This also indicates a substantial royalty. **A15283:25-15284:7**.

398. Genencor's product has distinct technical and commercial advantages attributable to the patented technology. Therefore, the royalty would be substantial. **A15285:2-15286:21**.

399. Genencor made extensive and very successful use of its infringement, which indicates the value of the patented technology. No acceptable alternative was available. Again, the royalty should be substantial. **A15106:9-25; A15110:18-24; A15180:2-15181:19; A15237:4-15238:21; A15240:18-15241:20; A15242:23-15248:20; A15350:22-15351:17; TE485, A16630**.

400. Novozymes does not license its core technology, except occasionally to settle a dispute or cross-license something else of value. **A15016:1-15017:13; A15281:20-15282:13; A15320:8-22; A15353:1-25**. This indicates a substantial royalty.

401. The hypothetical negotiator would also have seen price erosion as prompting a substantial royalty. The parties would understand that "Novozymes would be looking for some sort of compensation to make sure that they were not loosing more than the sale itself." **A15334:3-12**.

402. The "rule of thumb" is another method used to estimate a reasonable royalty. It provides that the rate should be between 1/4 and 1/3 of the profits attributable to the invention. Since the profit margin for Spezyme Ethyl was 71%, the corresponding royalty ranges from 18-24%. **A15290:3-15291:14**.

403. The reasonable royalty can also be quantified analytically as a royalty that would account for the difference between the profit margin on the patented product and the normal margin for that business, i.e. for an unpatented product. **A15291:15-25**. *TWM Mfg. Co. v. Dura Corp.*, 789 F.2d 895, 899-900 (Fed. Cir. 1986). The on-going and expected future profit margin for the infringing Spezyme Ethyl product was 71%. **A15290:14-15291:11; A15332:24-15333:16**. Genencor's next best product, and the only real benchmark, was Spezyme Fred. **A15292:1-19**; **TE-491, A16642**. (Spezyme Xtra is not a proper benchmark. **A15247:6-15248:16; A15530:24-15331:18; A15203:11-19; A15293:3-15; TE-447, A16232**). The margin for Fred was 44%. **A15292:1-19**. The difference between these margins is 71-44 = 27%. ***Id.***

404. These approaches provide a royalty of 18-27%, with the rule of thumb and the analytical method supporting each other at the higher end of the range.

405. In the totality of circumstances here, a royalty near but less than the top of the range would have been the right compromise and a fair and reasonable royalty for the '031 invention. A 25% royalty would be a minimum reasonable rate to compensate Novozymes and still leave Genencor with a significant margin." **A15292:20-15293:2**. This would have Genencor still make more (71-25=46%) than it did on Spezyme Fred (44%). **A15292:1-15293:2; A15551:4-15552:10**.

406. If a royalty is assessed for any infringing Spezyme Ethyl sales to the U.S. fuel ethanol market, 25% this is the right royalty rate to compensate Novozymes as the minimum in appropriate damages for Genencor's infringement. 35 U.S.C. § 284. This rate should be applied to the portion of Genencor's U.S. sales of Spezyme Ethyl that are not recoverable as lost profits (if any), as adjusted for the 10% discount Genencor gives to its distributor, EDC. **A15293:16-15294:8**.

407. If all U.S. sales of Spezyme Ethyl are subject to the 25% royalty, the total would be $5,096,780, plus the lower royalty for secondary sales of $56,087, for a total of $5,152,867 plus pre-judgment plus interest. **A15374:4-15378:21**.

E. NOVOZYMES IS ENTITLED TO PREJUDGMENT INTEREST AND COSTS

408. "An award of prejudgment interest serves to make the patentee whole because the patentee also lost the use of its money due to infringement." *Crystal Semiconductor*, 246 F.3d at 1361.

409. There are no circumstances here that would justify the denial of prejudgment interest, such as a delay in filing suit. Suit was filed on the day the patent issued. *General Motors Corp. v. Devex Corp.*, 461 U.S. 648, 657 (1983) ("Prejudgment interest should be awarded under § 284 absent some justification for withholding such an award."); *Crystal Semiconductor*, 246

F.3d at 1346 ("the discretion of the district court in denying prejudgment interest is limited to specific circumstances").

410. An appropriate rate for prejudgment interest is the prime rate, compounded annually.

411. This Court shall order an accounting to determine the proper amount of prejudgment interest.

F. GENENCOR'S INFRINGEMENT WAS WILLFUL

412. "The tort of willful infringement arises upon deliberate disregard for the property rights of the patentee." *Vulcan Eng'g Co. v. FATA Aluminum, Inc.*, 278 F.3d 1366, 1378 (Fed. Cir. 2002). Willful infringement "is not simply a conduit for enhancement of damages; it is a statement that patent infringement, like other civil wrongs, is disfavored, and intentional disregard of legal rights warrants deterrence." *Knorr-Bremse Systeme Fuer Nutzfahrzeuge GmbH v. Dana Corp.*, 383 F.3d 1337, 1342 (Fed. Cir. 2004) (en banc). "'Where, as here, a potential infringer has actual notice of another's patent rights, he has an affirmative duty to exercise due care to determine whether or not he is infringing'" (*Id.*) (quoting *Underwater Devs., Inc. v. Morrison-Knudsen Co.*, 717 F.2d 1380, 1389-90 (Fed. Cir. 1983)). *See also Jurgens v. CBK, Ltd.*, 80 F.3d 1566, 1571 (Fed. Cir. 1996).

413. Willfulness is a fact question, proven by clear and convincing evidence in the totality of circumstances. *John Hopkins Univ. v. Baxter Healthcare Corp.*, 152 F.3d 1342, 1363 (Fed. Cir. 1998). *See SRI Int'l, Inc. v. Advanced Tech. Labs., Inc.*, 127 F.3d 1462, 1464-65 (Fed. Cir. 1997):

> [T]he primary consideration is whether the infringer, acting in good faith and upon due inquiry, had sound reason to believe that it had the right to act in the manner that was found to be infringing. The law of willful infringement does not search for minimally

> tolerable behavior, but requires prudent, and ethical, legal and commercial action.

See also Vulcan Eng'g Co., 278 F.3d at 1378; *Knorr-Bremse*, 383 F.3d at 1347.

414. This is a glaring case of "deliberate disregard" of patent rights to maximize profit. *Vulcan Eng'g*, 278 F.3d at 1378.

415. Genencor was aware of the pending and issued '031 patent. It continued with Spezyme Ethyl, so it could regain dominance in the market, rather than continue to lose sales with an inferior, less profitable product. *Applied Med. Resources Corp. v. U.S. Surgical Corp.*, 435 F.3d 1356, 1365 (Fed. Cir. 2006) (willful to continue infringing when defendant "desperately needed a universal seal trocar to remain competitive in the surgical business"); *Rosemount, Inc. v. Beckman Instruments, Inc.*, 727 F.2d 1540, 1547-48 (Fed.Cir. 1984) (defendant "knowingly, deliberately, willfully and wantonly infringed because of market pressure").

416. Genencor led the fuel ethanol market in the 1990s, but its sales evaporated after Novozymes launched its superior Liquozyme products in 1999. **A15180:2-15181:19; A15090:19-15094:11**.

417. Genencor recognized that its old products were "not as good as Liquozyme" and were "not particularly well suited" for fuel ethanol production. **15181:20-185:5**; **A10024, ¶ 58**.

418. Genencor was desperate for a new product that could compete with Liquozyme and bolster its dwindling market share. **TE-230, A16018.**

419. It acquired EBS to gain access to other alpha-amylases, but in a consent judgment, EBS and Genencor agreed to withdraw EBS-1. **TE2-30, A16022; A15184:6-186:6;** . **A15371:10-23**. **A15377:15-15378:10**.

420. Genencor then spent over a year trying to improve its existing Spezyme Fred product, without success. **A10024, ¶ 58; A5037:15-5039:11**

421. By August 2003, Genencor still had no competitive alternative. Its existing alpha-amylases were "hampered by technical performance and economic issues," which left the company "uncompetitive" and with "a significant gap" in the market vis-à-vis Novozymes. **TE-230, A160018, 160022**; **A15186:11-15187:3**.

422. EBS-2 was Genecor's only option to compete with Novozymes. **TE-230, A160018**. Genencor projected diverting millions in annual profits from Novozymes. ***Id.*** **at A16016**.

423. However during the subsequent development of EBS-2 (Spezyme Ethyl), Genencor knew that Novozymes had a pending patent. **TE-228, A16005-06**. Genencor knew that Novozymes claimed a deletion "corresponding to the deletion present in EBS2" (so EBS-2 would infringe). Genencor hoped that Novozymes' application would be rejected by the PTO as obvious over the Suzuki reference. ***Id.*** Because it had no other "viable short term option," Genencor simply rolled the dice, began sales of Spezyme Ethyl in April 2004, and gambled that Novozymes' the '648 application would not become a patent. **TE-228, at 16006; A10023 at ¶ 57**.

424. This gamble did not pay off. On September 21, 2004, the PTO issued a Notice of Allowance. The examiner specifically found that the claimed invention was non-obvious and patentable over Suzuki based on evidence of unexpected results. **A10011-14, 10017-21, ¶¶ 26, 30-33, 42-52**.

425. Novozymes promptly sent Genencor a letter on September 29, 2004, enclosing a copy of the Notice of Allowance and the allowed claims that would soon issue as the '031 patent.

Novozymes also told Genencor that Spezyme Ethyl would infringe. **TE-320 at 16074; A15128:18-15130:7; A15216:12-22, A15220:2-15222:1.**

426. The '031 patent issued five months later, on March 15, 2005. **TE-100, A7001.**

427. Genencor ignored this advance notice. It did not respond to the letter, did not discontinue Spezyme Ethyl, and did not begin development of an alternative.

428. Genencor did not present any evidence that it sought or obtained advice of counsel on the '031 patent, or otherwise tried to discharge its "affirmative duty to exercise due care" to avoid infringement. *Knorr-Bremse*, 383 F.3d at 1343.

429. Genencor asserted privilege for any opinion of counsel on the '031 patent. **A15213:20-15214:18; A15222:8-13; A15379:3-15382:13; A15391:13-15392:17.** This does not create an inference that the advice was unfavorable. *Knorr-Bremse*, 383 F.3d at 1344. Likewise, there is no inference that the advice was competent or favorable. Genencor cannot rely on assertions of privilege as evidence of due care. *L.A. Gear, Inc. v. Thom McAn Shoe Co.*, 988 F.2d 1117, 1126-27 (Fed. Cir. 1993) ("Although a party to litigation may indeed withhold disclosure of the advice given by its counsel, as a privileged communication, it will not be presumed that such withheld advice was favorable to the party's position.").

430. Genencor just carried on, unabated. *Advanced Cardiovascular Sys., Inc. v. Medtronic, Inc.*, 265 F.3d 1294, 1310 (Fed. Cir. 2001) (willful infringement when defendant "controlled its own destiny" by continuing sales after patent issued and after lawsuit began); *National Presto Indus., Inc. v. West Bend Co.*, 76 F.3d 1185, 1193 (Fed. Cir. 1996) (willful infringement when defendant knew of pending application for months, plaintiff filed suit on day patent issued, and defendant continued infringing); *Golden Blount*, 438 F.3d at 1369 (willful infringement when defendant "made little-to-no effort to assess whether it infringed or whether

the patent was invalid after receiving notice"); *Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327, 1339 (Fed. Cir. 2004) (willful infringement when defendant undertook no investigation after receiving cease-and-desist letter and continued to sell its inventory of infringing products).

431. Genencor had no objective and good-faith reason to believe, at the time the patent issued, that it was entitled to continue sales of Spezyme Ethyl. Good faith requires that a "prudent person would have sound reason" to believe that a product did not infringe or that the patent was invalid, "and would be so held if litigated." *Knorr-Bremse*, 383 F.3d at 1347.

432. Genencor's attorneys later developed arguments contesting liability at trial. However, such arguments "are not equivalent" to activities "which qualify as 'due care' before undertaking any potentially infringing activity." *Crystal Semiconductor Corp. v. Tritech Microelecs. Int'l, Inc.*, 246 F.3d 1336, 1352 (Fed. Cir. 2001).

433. Genencor was fully aware that Spezyme Ethyl infringed the '031 patent. **A15383:3-15384:10**. Its Vice President of Applications, Mr. Crabb, admitted that Spezyme Ethyl "corresponded" to the claims in the pending '031 Patent. **TE-228, A16006**.

434. Rather than attempt to design around these claims or take other steps to avoid infringement, Genencor simply "concluded" (i.e., hoped) that the pending patent would be rejected as obvious over Suzuki. *See id.*

435. However, Genencor had no substantial reason to believe that the patent, once issued, was invalid. After the PTO rejected the relevant claims over Suzuki, Novozymes presented evidence of unexpected results through the Borchert declaration. The PTO then expressly held that the patent was not obvious over Suzuki, and it allowed the claims. **A10013-10021, ¶¶ 30-52**.

436. Once allowed, a patent is presumed valid. 35 U.S.C. §282. An initial rejection, followed by a subsequent allowance, "hardly justifies a good faith belief of the invalidity of the claims." *Acoustical Design, Inc. v. Control Electronics Co.*, 932 F.2d 939, 942 (Fed. Cir. 1991).

437. Genencor placed its faith in Crabb's testimony about Suzuki and its description of similar 179,180 deletions in a different microorganism, and without more, ignored the '031 patent. **A15389:5-15391:12**. There is no evidence that when Genencor infringed, Crabb or anyone else considered the '031 allowance, the file history, or the unexpected results. No one made a diligent inquiry or a factual, technical and legal analysis to support a good-faith conclusion of invalidity. Actually, Crabb testified that he "did not do anything" after Genencor received notice of the allowed '031 claims, and that he "[did not] have any knowledge" of what anyone else had done. **A15222:16-23, A15224:7-15**. Crabb further acknowledged that he had only a lay understanding of patent law; yet no help from anyone else was relied on. **A15217:25-15218:7**. This was in the context of actual notice of '031 infringement, and litigation with Novozymes over EBS-1/Ultra-pHLo under the sister '038 patent.

438. Such studied ignorance and naïve belief by a lay witness falls far short of a "sound reason" for invalidity or for infringing an issued patent. *Knorr-Bremse*, 383 F.3d at 1347. *Golden Blount*, 438 F.3d at 1365 (willful infringement when attorney's opinion was based solely on assertion that "for 20 years or more, the whole industry has been making things like that"); *Rosemount*, 727 F.2d at 1548 (in-house memos by engineers that "they see nothing patentable" in plaintiff's invention failed to establish "honest doubt" of validity and infringement). Such "bald, conclusory and unsupported remarks regarding validity" indicate bad faith. *Underwater Devs.*, 717 F.2d at 1390.

439. Genencor's asserted belief that the '031 patent was obvious is contradicted by its own representations to the PTO. In April 2005, Genencor filed a patent application for Spezyme Ethyl. This was just three weeks after the '031 patent issued and this suit was filed. **TE-100, A7001.** Genencor's claims included the same variants, with deletions of the same 179,180 residues in same *B. stearothermophilus*. **TE-202, A8532.1, A8532.44; A6538:24-6540:7.** Genencor cited Suzuki, but asserted that these variants are "more effective" and are patentable over the prior art. **TE-202, A8532.14-8532.15.** While claiming patentability in its own application, Genencor says it thought the same variants were unpatentable to Novozymes in the granted '031 patent, in view of the same prior art.

440. This underscores that Genencor had no good faith reason to discount the '031 patent, and on the contrary, said and had reason to believe that it was valid and infringed.

441. Genencor continued its infringing sales of Spezyme Ethyl for as long as possible rather than switch to any non-infringing, albeit inferior and less profitable, alternatives.

442. At trial, Genencor asserted that it could have avoided infringement by developing Spezyme Xtra by March 2005. **A15401:21-15403:2.** However, Genencor did not begin on Xtra until June or September of 2005. **A15193:19-15194:21.** It knew that Xtra had poor performance and that its cost would be "substantially higher" than Spezyme Ethyl. A $9.8 million loss was projected. **A15203:11-15205:13; TE-298, 16068; A15195:22-15197:22; TE-447, A16232.**

443. Genencor only developed the less-than Xtra as its last resort "contingency plan" and did not begin sales in earnest until after the Court found against Spezyme Ethyl. **TE-447, A16232; A15194:22-25; A15403:11-14.** It also did not switch customers to Spezyme Fred.

444. Genencor decided to continue selling as much Spezyme Ethyl as it could for as long as possible, to maximize its profits. *See Applied Med.*, 435 F.3d at 1365 (affirming

willfulness where defendant only began developing non-infringing product in response to possible injunction); *Avia Group Int'l, Inc. v. L.A. Gear California, Inc.*, 853 F.2d 1557, 1566-67 (Fed. Cir. 1988) (affirming willfulness where defendant had "intentionally accepted the risk of infringement" by continuing infringing sales after patent issued and lawsuit was filed); *Knorr-Bremse Systeme Fuer Nutzfahrzeuge GmbH v. Dana Corp.*, 372 F. Supp. 2d 833, 847 (E.D. Va. 2005) (opinion after remand) (where a party "continues to engage in infringing behavior until a modified product is ready for distribution, a finding of willful infringement is warranted").

445. Novozymes' presented at least "threshold evidence of culpable behavior," which shifted the burden shifts to Genencor "to put on evidence that it acted with due care." *Golden Blount,* 438 F.3d at 1368. It failed to do so.

446. Genencor offered only two specious arguments: (1) that it had acted with good faith concerning the sister '038 patent, and (2) that a preliminary injunction was denied.

447. First, Crabb testified that Genencor "took great care" to avoid infringement of the sister '038 patent. **TE-228, A16007**; **A15211:6-16**. However, that patent has entirely different claims than the '031 patent-in-suit. Genencor's cannot rely in good-faith on its irrelevant opinion of counsel concerning the '038 patent. *Advanced Cardiovascular Sys., Inc. v. Medtronic, Inc.*, 265 F.3d 1294, 1309 (Fed. Cir. 2001) ("no logical connection between its receipt of the earlier opinions [concerning non-infringement of other patents] and its intent with regard to the [patent-in-suit]."). This further supports that the '031 patent was deliberately disregarded. *Golden Blount*, 438 F.3d at 1369 (reaffirming that reliance on incompetent opinions is evidence of bad faith).

448. Crabb also said that Genencor believed the pending application for the '031 patent would be rejected by the PTO as obvious. **A15211:17-212:10; TE- 228, A16006**. However, once

the '031 Patent did in fact issue in March 2005, Genencor then had a duty to act with due care to avoid infringement. *National Presto*, 76 F.3d at 1193. Genencor could no longer rest on an incorrect assumption that the patent would be rejected. *Acoustical Design*, 932 F.2d at 942.

449. Second, Genencor relies on the Court's Order of October 26, 2005, which denied Novozymes' motion for a preliminary injunction. **A15391:10-15393:7**. This was more than seven months after Genencor began its infringement. It has no bearing on Genencor's asserted good faith as of March 2005, when the patent issued. *Knorr-Bremse*, 383 F.3d at 1343 (good faith requires diligence "before the initiation of any possible infringing activity"); *John Hopkins Univ. v. CellPro, Inc.*, 152 F.3d 1342, 1362-63, 1365 (Fed. Cir. 1998) (defendant's "temporary victory" during litigation "has no bearing" on good faith when defendant began its infringement). Moreover, the Court found only that substantial issues existed for trial, not that the patent would likely be held invalid. *Hoechst Celanese Corp. v. BP Chems. Ltd.*, 78 F.3d 1575, 1584 (Fed. Cir. 1996) (affirming willfulness notwithstanding parallel finding of a "substantial new question" of patentability by the PTO, because that finding "does not establish a likelihood of patent invalidity").

450. Genencor did not act with due care, discounted Novozymes' rights, and willfully infringed.

G. NOVOZYMES IS ENTITLED TO TREBLE DAMAGES FOR WILLFUL INFRINGEMENT

451. A court may award up to treble damages for willful infringement. 35 U.S.C. § 284. "In exercising this discretion, the trial court considers the weight of the evidence of the infringer's culpability in light of the factors included in *Read*." *John Hopkins Univ.*, 152 F.3d at 1365 (citing *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 827 (Fed. Cir. 1992)). "The paramount

determination in deciding to grant enhancement and the amount thereof is the egregiousness of the defendant's conduct based on all the facts and circumstances." *Read*, 970 F.2d at 826.

452. The following *Read* factors support a full award of treble damages.

453. Genencor deliberately copied Novozymes' ideas. It knew that Spezyme Ethyl was being patented by Novozymes. Indeed, Genencor went from EBS-1, which infringed a different patent, to EBS-2 a "me too" under the '031 patent. **TE-230, A16022; A15184:6-186:6; A-10040, 38.**

454. Genencor did not duly investigate the '031 patent and had no good-faith basis for a belief of invalidity or non-infringement. **A15383:3-15384:10; TE-228, A16006**.

455. Genencor was motivated to infringe and intended the harm that occurred, because of the urgency to reclaim the fuel ethanol market at any cost.

456. The market was in a two-supplier market, and Genencor knew that any sales it gained would come from Novozymes. **A15222:16-23, A15224:7-15**.

457. Genencor continued to infringe during the litigation and took no remedial action when it says it could have. **A15193:19-15194:21**.

458. Nor was the litigation particularly close. Genencor did not have a substantial defense of non-infringement. Its primary arguments were inequitable conduct and that the patent was obvious over Suzuki and Machius. The PTO expressly considered Suzuki, the allegations of inequitable conduct and bogus unexpected results were unfounded, and Machius was cumulative. **A10044-10065.**

459. Genencor also sought to maintain the attorney/client privilege as to the '031 patent while trying to implying that it had received favorable legal advice. **A15379:3-15382:13; A15391:13-15392:17; TE-228, A16005-06.**

460. Finally, Genencor is a major company that can afford an award of treble damages.

461. Treble damages are appropriate.

H. THIS IS AN EXCEPTIONAL CASE AND NOVOZYMES IS ENTITLED TO ATTORNEYS FEES

462. This case is exceptional because of Genencor's egregious willful infringement. It knowingly sold an infringing product and risked litigation, rather than make diligent inquiry or take reasonable steps to avoid infringing.

463. Novozymes should recover its attorneys fees for having to defending its patent rights in these circumstances. 35 U.S.C. § 285; *Golight,* 355 F.3d at 1339-40.

I. NOVOZYMES IS ENTITLED TO A PERMANENT INJUNCTION

464. A patent grants its owner a right to exclude others from the patented invention. 35 U.S.C. §283. An injunction is the means by which this right is enforced. *Hybritech Inc. v. Abbott Labs.,* 849 F.2d 1446, 1456-57 (Fed. Cir. 1988).

465. *eBay Inc. v. Mercexchange, L.L.C.*, 126 S. Ct. 1837, 1839 (2006) delineated four factors to weigh in determining whether to grant an injunction: (1) irreparable harm; (2) inadequacy of legal remedies; (3) balance of hardships; and (4) public interest. The presumption of harm is embedded in this test. *Abbott Labs. v. Andrx Pharms., Inc.*, 452 F.3d 1331, 1348 (Fed. Cir. 2006); *Polymer Technologies, Inc. v. Bridwell*, 103 F.3d 970, 973 (Fed. Cir. 1996); *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1247 (Fed. Cir. 1989).

466. *eBay* does not do away with injunctions in patent cases, nor provide compulsory licensing of patents to infringers. It simply says that an injunction is not automatic.

467. Here, there was irreparable harm beyond the presumption of harm. *eBay*, 126 S. Ct. at 1839; *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1247 (Fed. Cir. 1989). The principle value of a patent is exclusivity, which money does not address. *Hybritech,* 849 F.2d at

1456-57. Money for past losses does not address on-going residual harm, nor threat of future injury.

468. Genencor transformed the market by infringement. It lowered prices, eroded market share, and created an anti-Novozymes climate that will be hard to reverse if Sezyme Ethyl is not enjoined. *Purdue Pharma L.P. v. Boehringer Ingelheim GMBH,* 237 F.3d 1359, 1368 (Fed. Cir. 2001); *Polymer Techs., Inc. v. Bridwell,* 103 F.3d 970 (Fed. Cir. 1996). This includes a loss of good will and damage to reputation for innovation. *Bio-Tech. Gen. Corp. v. Genentech, Inc.* 80 F.3d 1553, 1566 (Fed. Cir. 1996); *Fisher-Price, Inc. v. Safety 1st, Inc.*, 279 F. Supp. 2d 526, 528 (D. Del. 2003); *Solarex Corp. v. Advanced Photovoltaic Sys. Inc.*, 34 U.S.P.Q.2d 1234, 1240 (D. Del. 1995).

469. The hardship tips heavily for Novozymes. *eBay*, 126 S. Ct. at 1839. An injunction would ensure as much of a return to pre-infringement as possible. It will secure jurisdiction in case of future infringement problems with Spezyme Ethyl, with an expeditious way to resolve them, *e.g.*, a motion for contempt.

470. The lack of any restraint on Genencor would invite further harm and encourage encroachment by others.

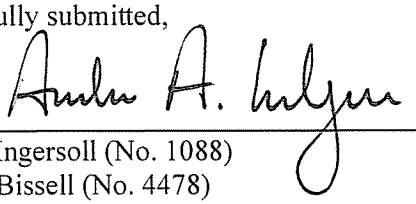
471. There will be no harm to Genencor from an injunction to forbear from infringement. *Windsurfing Int'l, Inc. v. AMF, Inc.*, 782 F.2d 995, 1003 n.12 (Fed. Cir. 1986)("One who elects to build a business on a product found to infringe cannot complain").

472. Genencor claims it has discontinued Spezyme Ethyl, but makes no pledge for the future. Even at the trial, Genencor was careful to refer only to what it "currently" plans. **A15420:20-15422:11**.

473. Infringement continues as customers use up their stock. Genencor has yet to confront market reaction to the loss of this infringing supply. **A15530:24-15531:13**. "The fact that the defendant had stopped infringing is generally not a reason for denying an injunction against future infringement," 7 Ernest Bainbridge Lipscomb III, Lipscomb's Walker on Patents § 25:35 (3d ed. 1988). "The argument in such circumstances is very simple. If the defendant be honest in his protestations, an injunction will do him no harm; if he be dishonest, the court should place a strong hand upon him." *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 842 F.2d 1275, 1282 (Fed. Cir. 1988).

474. Policy also favors an injunction. The public interest is best served by the protecting patent rights. *H.H. Robertson v. United Steel Deck, Inc.*, 820 F.2d 384, 391 (Fed. Cir. 1987); *Solarex,* 34 U.S.P.Q.2d at 1241. No public interest that would be injured. *Hybritech*, 849 F.2d at 1458.

Respectfully submitted,



Dated: November 17, 2006

Josy W. Ingersoll (No. 1088)
Rolin P. Bissell (No. 4478)
Karen E. Keller (No. 4489)
Andrew A. Lundgren (No. 4429)
YOUNG CONAWAY STARGATT & TAYLOR, LLP
1000 West Street, 17th Floor
Wilmington, Delaware 19801
(302) 571-6600
alundgren@ycst.com

Attorneys for Novozymes A/S

Joseph R. Robinson (*Pro Hac Vice*)
Robert C. Sullivan, Jr. (*Pro Hac Vice*)
Robert Schaffer (*Pro Hac Vice*)
DARBY & DARBY PC
805 Third Avenue
New York, New York 10022-7513
(212) 527-7700

Of Counsel

CERTIFICATE OF SERVICE

I, Andrew A. Lundgren, hereby certify that on November 17, 2006, I caused to be electronically filed a true and correct copy of the foregoing document with the Clerk of the Court using CM/ECF, which will send notification that such filing is available for viewing and downloading to the following counsel of record:

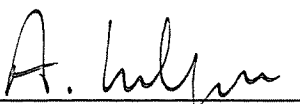
Donald E. Reid, Esquire
MORRIS NICHOLS ARSHT & TUNNELL
1201 North Market Street
PO Box 1347
Wilmington, DE 19899-1347

I further certify that on November 17, 2006, I caused a copy of the foregoing document to be served by hand delivery on the above-listed counsel of record and on the following non-registered participants in the manner indicated:

BY ELECTRONIC MAIL

Tharan Gregory Lanier, Esquire
Jane Froyd, Esquire
JONES DAY
2822 Sand Hill Road, Suite 240
Menlo Park, CA 94025

YOUNG CONAWAY STARGATT & TAYLOR, LLP



Andrew A. Lundgren (No. 4429)
The Brandywine Building
1000 West Street, 17th Floor
Wilmington, DE 19801
(302) 571-6600
alundgren@ycst.com

Attorneys for Novozymes A/S